

Stephen Lumsden, essay for Units 10-12, Program C: The First Philosophers

(Question 6. 'All that exists are atoms and the void.' - What is an atom? What is the void?)

What is an atom? What is the void?

In this essay we shall investigate the background from which the theory of Atomism originates. We shall then summarise Atomism as a theory and discuss possible arguments about it that would have been prevalent at the time. We shall compare and contrast this to previous materialist arguments and examine the theory's place in current philosophical and scientific debate before concluding with a comment on its significance today.

Parmenides argued that change was impossible. We only seem to think it is, as he described in his book, *The Way of Appearance*. The world, as it really is, was outlined in his book, *The Way of Truth*. There its objective reality represents one unchanging being, the 'One'. In explaining Parmenides' One, the Atomists, Leucippus and Democritus, posited that there exist a certain numbers of 'ones' in the form of the atoms. This represented 'being' in their eyes. However as Parmenides' theory forbids change or movement, the Atomists forwarded the idea the movement of these 'ones' was only possible through the 'void' (non-being), thus complying with the main tenets of Parmenides' *Way of Truth*.

What was the nature and form of such 'atoms' and 'void' ? We know that the Atomists thought that the atoms, in our world, were too small to be seen with the naked eye. They represented the smallest building blocks and together form all the stuff we can see. It is worth noting that this represented a purely rationalist argument, as we are asked to believe in something that is not visible, but should be logical in theory. This lies in contrast with other Pre-Socratic theories on the basic stuff such as Empedocles' four elements or Thales' water theory where we are easily allowed to envisage each building block, as we have already experienced it in nature. In this respect this realises the final step in the progression of thought on the Pre-Socratics' search for the 'basic stuff' that form the basic building blocks of the world, as initiated from Thales.

It was thought that the atoms would have to come in different shapes and sizes, most likely in order to be able to bond together. In this respect it is not surprising that, in the absence of modern physics or chemistry, the Atomists envisaged some having hooks which would connect into others in order to stick together and form chemical bonds, or molecules as we know them today. Simplicius mentioned that there was 'no more reason' to believe that the atoms should exist in various sizes, the larger ones presumably existing on worlds far away. It was also argued that mass appeared dependent on numerous atoms sticking together and density was related to the void between the atoms. Nevertheless consistence with Parmenides' theory is up kept, as there is no change or movement within the atoms themselves.

It is not known what Zeno or Parmenides would have made of the void though. It is important to distinguish our idea of empty space from the Atomist version of the void. The Atomists saw the void as complete non-being and did not equate the void with any kind of medium. Therefore they would not see the empty space between a magnet and metal as void, since the space there is still a medium in which magnetism is working. Likewise one cannot imagine them seeing the distant space between Earth and Sun as void either, because the force of gravity allows the Earth to circle its star. Therefore it is difficult to describe void in modern terms. The idea that atoms can move, come together, dissipate and re-form in the void does allow the appearance of change and so gives some kind of explanation for Heraclitus' earlier idea of flux. Zeno's Plurality Paradox is also dealt with, but only to a certain degree. Yes, we can divide everything into smaller pieces, but there is a limit.

The limit, of course, is encountered when we reach the atomic level; note the word atom means uncuttable. Modern day philosophers may say this is untrue, that atoms can be broken down into neutrons, protons, electrons, quarks etc. The author find himself at odds with this opinion, as modern physics tells us that such constituents may not exist without being part of a whole atom. Obviously we know that if the atom is split in a certain way we will experience an extreme burst of energy as seen though history in the case of the atomic bomb, but to all normal extents, atoms still represent the small working unit of matter. In this respect the basic stuff as dreamt of by the Atomists can be viewed as plausible even today.

Likewise modern physics will attribute physical properties to empty space, even when it is reduced to the vacuum of our solar system. Therefore the author finds it difficult picturing the void as imagined by the Atomists. This contrasts to the idea of an atom as a singular 'one', which is an instance of being, that is quite accessible. In trying to imagine non-being in the terms of the void, is this really possible? In this respect it is easy to side with Parmenides' view that there is no non-being, coming into being or going out of being. Everything just is. One imagines the Atomists over hastily creating the whole idea of void just to sidestep the problems posed in Parmenides' world, with its absence of change and movement.

In concluding we find ourselves agreeing with the Atomist view of each atom as a 'one', in line with Parmenides' view. In the absence of modern scientific method, the rational thought on the nature and structure of atoms was inventive and marks a clear progression of logical thought on earlier Pre-Socratic theories on the basic stuff of the world. The idea of the 'void' does not cohere so well. Nevertheless such discussion on the 'atoms' and 'void' only serves to remind us what we still need to discover today.

References

The Presocratic Philosophers (Cambridge University Press), by G.S. Kirk, J.E. Raven and M. Schofield, 1983

The Greek Philosophers: From Thales to Aristotle (University Paperbacks), by W.K.C Guthrie, 1968

Early Greek Philosophy (Penguin Classics), by Jonathan Barnes, 2001